Remarks

This application has been carefully reviewed in light of the Office Action mailed February 6, 2008. By this amendment, Applicants have amended claims 20, 23-26, 30, 35-36, and 39, added new claims 40-43 and canceled claims 28-29, 33 and 38. No new matter has been introduced by these amendments. Applicants do not admit that these amendments were necessary as a result of any cited art. Applicants respectfully request reconsideration of the above application in view of the following remarks.

Substitute Specification

A substitute specification excluding claims, and a marked up copy of the same are attached herewith in accordance to 37 C.F.R. §1.125. The substitute specification is believed to satisfy the Examiner's request to provide a current version which contains amendments made to the specification during the course of prosecution for the above application number. The substitution specification does not contain any new matter.

Rejection of Claims 20-21, 28-31 & 38-39 Under 35 U.S.C. § 102(b) As Being Anticipated By Frey et al.

Claims 20-21, 28-31 & 38-39 stand rejected under 35 U.S.C. § 102(b) as being anticipated by *Frey et al.* (U.S. Patent No. 6,232,674). Applicants respectfully request reconsideration of its rejection because *Frey et al.* fails to disclose features of claims 20-21, 28-31 & 38-39.

For instance, *Frey et al.* fails to disclose claim 20, which recites, *inter alia*, "wherein the module SMM is adapted to assess a state of the DC/DC converter for determining the presence of a short circuit condition in the architecture and to control the power distribution unit to connect/disconnect the loads in response to the first and second voltage signals." In particular, *Frey et al.* fails to utilize any such signals generated by the DC/DC converter 13 to determine the presence of short-circuit condition. *Frey et al.* discloses that the DC/DC converter

13 transmits input signals to ports 27 and 28 of the control and regulating unit 12 (see Figure 1). The Examiner asserts that the input to port 28 (e.g., U30a) of the control and regulating unit 12 of *Frey et al.* is the same as the presently claimed first voltage signal, the input to port 27 (e.g., U30) of the control and regulating unit 12 of *Frey et al.* is the same as the presently claimed second voltage signal, and that the control and regulating unit 12 of *Frey et al.* is the same as the presently claimed module SMM. (See Final Office Action, mailed February 6, 2008, p. 4, lines 1-12). Assuming, *arguendo*, that the input to port 28 (e.g., U30a) of the control and regulating unit 12 of *Frey et al.* is the same as the presently claimed first voltage signal, the input to port 27 (e.g., U30) of the control and regulating unit 12 of *Frey et al.* is the same as the presently claimed second voltage signal, and that the control and regulating unit 12 of *Frey et al.* is the same as the presently claimed module SMM as asserted by the Examiner (all points of which the Applicants do not agree with), *Frey et al.* fails to disclose that the control and regulating unit 12 includes any such hardware or software to determine the presence of a short circuit condition in the system in response to the signals transmitted from the DC/DC converter 13 and received on the ports 27 and 28.

At best, *Frey et al.* discloses a system for determining the point in time in which it is optimal to connect multiple batteries (16, 18) in parallel with each other in the event either battery 16, 18 exhibits an undervoltage condition which prevents a user from starting the vehicle. Such a condition is exhibited in the following passage:

> The battery intended for the starter is advantageously supplied as needed from the on-board electrical system via a direct voltage converter. **If the voltage level of one of the two batteries drops below a predeterminable value, then emergency operation can be carried out, in which the starter battery can be charged from the other battery via a direct voltage converter sufficient to assure restarting.** By using an error memory located in the on-board electrical system, emergency operation information can be stored in memory and displayed the next time the engine is started or the next time the vehicle is in the shop, and if necessary the operating state of the control device is reset to the sleep mode.
>
> (See col. 2, l. 14-26, emphasis added.)

As illustrated with the above passage, *Frey et al.* is concerned with undervoltage conditions, not with short-circuit conditions. Again, such a condition is reinforced by the following passages:

> Via a mechanical contact, for instance in the ignition lock to ground or after terminal Kl. 30a, symbolized by the switch 22, the field effect transistor 23 of the supply network element 11 is made conducting, and the total supply of the on-board control device 10a is activated. Once the microcomputer of the control and regulating unit 12 is booted up, the microcomputer first checks the voltage situation on the on-board electrical system side, that is, at the terminal Kl. 30. **To that end, the control and regulating unit is supplied with the voltage U30 via the input. If these voltages are above a programmable value, for instance of 11.8 V, then the two battery circuits remain separate.** The on-board control device 10a then waits for the information that says starting has occurred. If this information has not arrived within a predeterminable period, such as 30 seconds, then the total current supply is deactivated. The field effect transistor 23 in the supply network element 11 is switched over to the blocked state by triggering from the microcomputer, and the on-board control device 10a returns to the "sleep mode".
>
> (See col. 3, l. 35-53, emphasis added.)

> 2. Function During Emergency Operation
>
> With the exemplary embodiment of FIG. 1, **emergency operation is still possible in the event that the on-board electrical system voltage has dropped too low.** If after the initialization phase and interrogation of the on-board electrical system voltage, it is found that this voltage is below a minimum predetermined voltage level, emergency operation is tripped. **To that end, when the predetermined voltage level fails to be attained, both batteries 16 and 18 are connected parallel by the on-board control device, and thus the on-board electrical system is also supplied from the starter battery 16. At the same time, emergency operation information is transmitted, so that the consumers can be turned off as needed via the electronic switches upstream of them; it will be noted that only those consumers that are not relevant to function or safety will be**

> **turned off.** In addition, an error memory located on the on-board electrical system side can be used, or a display can be tripped.
>
> (See col. 4, l. 31-47, emphasis added.)

While *Frey et al.* discloses turning off various consumers or loads as noted in the passage directly above, such a shut down of the loads are not due to short circuit conditions. In contrast, the shutting down of the loads are attributed to undervoltage conditions and the need to continue to provide functionality provided by loads configured to provide safety features for the driver in the event the vehicle experiences such undervoltage conditions. *Frey et al.* discloses the need to direct low battery voltage to drive safety related devices at the expense of shutting non-essential functionality down. *Frey et al.* does not disclose shutting non-essential functionality down due to short circuit conditions. In the event *Frey et al.* was concerned with short circuit conditions, one would have to speculate why *Frey et al.* differentiates between non-essential functionality or safety related functionality. Generally speaking, when a circuit experiences a short-circuit condition, differentiating between non-essential functionality and safety related functionality is not a factor that comes into play.

For at least these reasons, claim 20 is patentable over *Frey et al.* and the other references of record. Further, claim 21 depending from claim 20, is patentable over *Frey et al.* and the other references of record for the above state reasons as well as their own limitations.

Frey et al. fails to disclose claim 30, which recites, *inter alia*, "assessing a state of the converter DC/DC to determine the presence of a short circuit condition in the architecture in response to the first and second voltage signals [.]" In particular, *Frey et al.* fails to utilize any such signals generated by the DC/DC converter 13 to determine the presence of short-circuit condition. *Frey et al.* discloses that the DC/DC converter 13 transmits input signals to ports 27 and 28 of the control and regulating unit 12 (see Figure 1). The Examiner asserts that the input to port 28 (e.g., U30a) of the control and regulating unit 12 of *Frey et al.* is the same as the presently claimed first voltage signal and the input to port 27 (e.g., U30) of the control and regulating unit 12 of *Frey et al.* is the same as the presently claimed second voltage signal. (See

Final Office Action, mailed February 6, 2008, p. 4, lines 1-12). Assuming, *arguendo*, that the input to port 28 (e.g., U30a) of the control and regulating unit 12 of *Frey et al.* is the same as the presently claimed first voltage signal and the input to port 27 (e.g., U30) of the control and regulating unit 12 of *Frey et al.* is the same as the presently claimed second voltage signal (all points of which the Applicants do not agree with), *Frey et al.* fails to disclose that the control and regulating unit 12 includes any such hardware or software to determine the presence of a short circuit condition in the system in response to the signals transmitted from the DC/DC converter 13 and received on the ports 27 and 28.

At best, *Frey et al.* discloses a system for determining the point in time in which it is optimal to connect multiple batteries (16, 18) in parallel with each other in the event either battery 16, 18 exhibits an undervoltage condition which prevents a user from starting the vehicle. Such a condition is exhibited in the following passage:

> The battery intended for the starter is advantageously supplied as needed from the on-board electrical system via a direct voltage converter. **If the voltage level of one of the two batteries drops below a predeterminable value, then emergency operation can be carried out, in which the starter battery can be charged from the other battery via a direct voltage converter sufficient to assure restarting.** By using an error memory located in the on-board electrical system, emergency operation information can be stored in memory and displayed the next time the engine is started or the next time the vehicle is in the shop, and if necessary the operating state of the control device is reset to the sleep mode.
>
> (See col. 2, l. 14-26, emphasis added.)

As illustrated with the above passage, *Frey et al.* is concerned with undervoltage conditions, not with short-circuit conditions. Again, such a condition is reinforced by the following passages:

> Via a mechanical contact, for instance in the ignition lock to ground or after terminal Kl. 30a, symbolized by the switch 22, the field effect transistor 23 of the supply network element 11 is made

> conducting, and the total supply of the on-board control device 10a is activated. Once the microcomputer of the control and regulating unit 12 is booted up, the microcomputer first checks the voltage situation on the on-board electrical system side, that is, at the terminal Kl. 30. **To that end, the control and regulating unit is supplied with the voltage U30 via the input. If these voltages are above a programmable value, for instance of 11.8 V, then the two battery circuits remain separate.** The on-board control device 10a then waits for the information that says starting has occurred. If this information has not arrived within a predeterminable period, such as 30 seconds, then the total current supply is deactivated. The field effect transistor 23 in the supply network element 11 is switched over to the blocked state by triggering from the microcomputer, and the on-board control device 10a returns to the "sleep mode".
>
> (See col. 3, l. 35-53, emphasis added.)
>
> 2. Function During Emergency Operation
>
> With the exemplary embodiment of FIG. 1, **emergency operation is still possible in the event that the on-board electrical system voltage has dropped too low.** If after the initialization phase and interrogation of the on-board electrical system voltage, it is found that this voltage is below a minimum predetermined voltage level, emergency operation is tripped. **To that end, when the predetermined voltage level fails to be attained, both batteries 16 and 18 are connected parallel by the on-board control device, and thus the on-board electrical system is also supplied from the starter battery 16. At the same time, emergency operation information is transmitted, so that the consumers can be turned off as needed via the electronic switches upstream of them; it will be noted that only those consumers that are not relevant to function or safety will be turned off.** In addition, an error memory located on the on-board electrical system side can be used, or a display can be tripped.
>
> (See col. 4, l. 31-47, emphasis added.)

While *Frey et al.* discloses turning off various consumers or loads as noted in the passage directly above, such a shut down of the loads are not due to short circuit conditions. In contrast, the shutting down of the loads are attributed to undervoltage conditions and the need

to continue provide functionality provided by predetermined loads that provide safety features for the driver in the event the vehicle experiences such undervoltage conditions. *Frey et al.* discloses the need to direct low battery voltage to drive safety related devices at the expense of shutting non-essential functionality down. *Frey et al.* does not disclose shutting non-essential functionality down due to short circuit conditions. In the event *Frey et al.* was concerned with short circuit conditions, one would have to speculate why *Frey et al.* differentiates between non-essential functionality or safety related functionality. Generally speaking, when a circuit experiences a short-circuit condition, differentiating between non-essential functionality and safety related functionality is not a factor that comes into play.

For at least these reasons, claim 30 is patentable over *Frey et al.* and the other references of record. Further, claim 31 depending from claim 30, is patentable over *Frey et al.* and the other references of record for the above state reasons as well as their own limitations.

Frey et al. fails to disclose claim 39, which recites, *inter alia*, "determining the presence of a short circuit condition if at least of one the first voltage signal indicates that the measured that the measured voltage at the output of the converter DC/DC exceeds the first predetermined value and the second voltage signal indicates that the measured voltage at the input of the converter DC/DC exceeds the second predetermined value[.]" In particular, *Frey et al.* fails to utilize any such signals generated by the DC/DC converter 13 to determine the presence of short-circuit condition. *Frey et al.* discloses that the DC/DC converter 13 transmits input signals to ports 27 and 28 of the control and regulating unit 12 (see Figure 1). The Examiner asserts that the input to port 28 (e.g., U30a) of the control and regulating unit 12 of *Frey et al.* is the same as the presently claimed first voltage signal and the input to port 27 (e.g., U30) of the control and regulating unit 12 of *Frey et al.* is the same as the presently claimed second voltage signal. (See Final Office Action, mailed February 6, 2008, p. 4, lines 1-12). Assuming, *arguendo*, that the input to port 28 (e.g., U30a) of the control and regulating unit 12 of *Frey et al.* is the same as the presently claimed first voltage signal and the input to port 27 (e.g., U30) of the control and regulating unit 12 of *Frey et al.* is the same as the presently claimed second voltage signal (all points of which the Applicants do not agree with), *Frey et al.* fails to disclose that the control and regulating unit 12 includes any such hardware or software to

determine the presence of a short circuit condition in the system in response to the signals transmitted from the DC/DC converter 13 and received on the ports 27 and 28.

At best, *Frey et al.* discloses a system for determining the point in time in which it is optimal to connect multiple batteries (16, 18) in parallel with each other in the event either battery 16, 18 exhibits an undervoltage condition which prevents a user from starting the vehicle. Such a condition is exhibited in the following passage:

> The battery intended for the starter is advantageously supplied as needed from the on-board electrical system via a direct voltage converter. **If the voltage level of one of the two batteries drops below a predeterminable value, then emergency operation can be carried out, in which the starter battery can be charged from the other battery via a direct voltage converter sufficient to assure restarting.** By using an error memory located in the on-board electrical system, emergency operation information can be stored in memory and displayed the next time the engine is started or the next time the vehicle is in the shop, and if necessary the operating state of the control device is reset to the sleep mode.
>
> (See col. 2, l. 14-26, emphasis added.)

As illustrated with the above passage, *Frey et al.* is concerned with undervoltage conditions, not with short-circuit conditions. Again, such a condition is reinforced by the following passages:

> Via a mechanical contact, for instance in the ignition lock to ground or after terminal Kl. 30a, symbolized by the switch 22, the field effect transistor 23 of the supply network element 11 is made conducting, and the total supply of the on-board control device 10a is activated. Once the microcomputer of the control and regulating unit 12 is booted up, the microcomputer first checks the voltage situation on the on-board electrical system side, that is, at the terminal Kl. 30. **To that end, the control and regulating unit is supplied with the voltage U30 via the input. If these voltages are above a programmable value, for instance of 11.8 V, then the two battery circuits remain separate.** The on-board control device 10a then waits for the information that says starting

> has occurred. If this information has not arrived within a predeterminable period, such as 30 seconds, then the total current supply is deactivated. The field effect transistor 23 in the supply network element 11 is switched over to the blocked state by triggering from the microcomputer, and the on-board control device 10a returns to the "sleep mode".
>
> (See col. 3, l. 35-53, emphasis added.)
>
> 2. Function During Emergency Operation
>
> With the exemplary embodiment of FIG. 1, **emergency operation is still possible in the event that the on-board electrical system voltage has dropped too low.** If after the initialization phase and interrogation of the on-board electrical system voltage, it is found that this voltage is below a minimum predetermined voltage level, emergency operation is tripped. **To that end, when the predetermined voltage level fails to be attained, both batteries 16 and 18 are connected parallel by the on-board control device, and thus the on-board electrical system is also supplied from the starter battery 16. At the same time, emergency operation information is transmitted, so that the consumers can be turned off as needed via the electronic switches upstream of them; it will be noted that only those consumers that are not relevant to function or safety will be turned off.** In addition, an error memory located on the on-board electrical system side can be used, or a display can be tripped.
>
> (See col. 4, l. 31-47, emphasis added.)

While *Frey et al.* discloses turning off various consumers or loads as noted in the passage directly above, such a shut down of the loads are not due to short circuit conditions. In contrast, the shutting down of the loads are attributed to undervoltage conditions and the need to continue provide functionality provided by loads configured to provide safety features for the driver in the event the vehicle experiences such undervoltage conditions. *Frey et al.* discloses the need to direct low battery voltage to drive safety related devices at the expense of shutting non-essential functionality down. *Frey et al.* does not disclose shutting non-essential functionality down due to short circuit conditions. In the event *Frey et al.* was concerned with short circuit conditions, one would have to speculate why *Frey et al.* differentiates between non-

essential functionality or safety related functionality. Generally speaking, when a circuit experiences a short-circuit condition, differentiating between non-essential functionality and safety related functionality is not a factor that comes into play.

For at least these reasons, claim 39 is patentable over *Frey et al.* and the other references of record.

Rejection of Claims 22-27 & 32-37 Under 35 U.S.C. § 103(a) As Being Unpatentable Over Frey et al. In View Of Turner et al.

Claims 22-27 & 32-37 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Frey et al.* (U.S. Patent No. 6,232,674) in view of Turner et al. (U.S. Patent No. 6,646,845). Applicants respectfully request reconsideration of this rejection because the proposed combination of *Frey et al.* and *Turner et al.* does not demonstrate that features of claims 22-27 & 32-37 are known in the art. Claims 22-27 depend from claim 20 and are patentable for the above stated reasons as well as their own patentable limitations. Claims 32, and 34-37 depend from claim 30 and are patentable for the above stated reasons as well as their own patentable limitations.

Conclusion

For the foregoing reasons, Applicants believe that the Office Action mailed on February 6, 2008, has been fully responded to. Consequently, in view of the above amendments and remarks, Applicants respectfully submit that the application is in condition for allowance, for which allowance is respectfully requested.

Please charge any fees or credit any overpayments as a result of the filing of this paper to our Deposit Account No. 02-3978.

If the Examiner believes a telephone interview would advance prosecution of this application in any manner, the Examiner is cordially invited to contact Martin J. Sultana, representative of Applicants, at the Examiner's convenience at 248-358-4400.

Respectfully submitted,

Carles Borrego Bel et al.

By /Martin J. Sultana/
Martin J. Sultana
Reg. No. 57,739
Attorney for Applicants

Date: May 6, 2008

BROOKS KUSHMAN P.C.
1000 Town Center, 22nd Floor
Southfield, MI 48075-1238
Phone: 248-358-4400
Fax: 248-358-3351